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ABSTRACT

Two-column objectives are listed for an integrated science curriculum (grades K-12), often subheaded according to science area (biology, health, general science, physical science) and grade level. Concepts regarding characteristics of living things are stressed in objectives for the primary grades (K-5), and reproductive biology is covered extensively in grades 6 and 7. Objectives are grouped for grade 7 in the areas of health and biology. One group includes the study of diseases of man, mental health, safety, and nutrition; another relates human physiology, heredity and cytology to the study of smoking, drinking and drug use. Objectives in grades 10-12 integrate areas of biology, physical science and health. Such topics as the following are included: (1) environmental influence on heredity with related studies in cells, genetics, reproduction and embryology; (2) disease and nutrition; (3) community health, with particular emphasis on cancer and cardiovascular disease; and (4) family structure and external social influences on man's health. Objectives are included for a higher level (grade 12) biology course, with topics such as celp cell ultrastructure, biochemistry of heredity, population genetics, and evolution. (CS)

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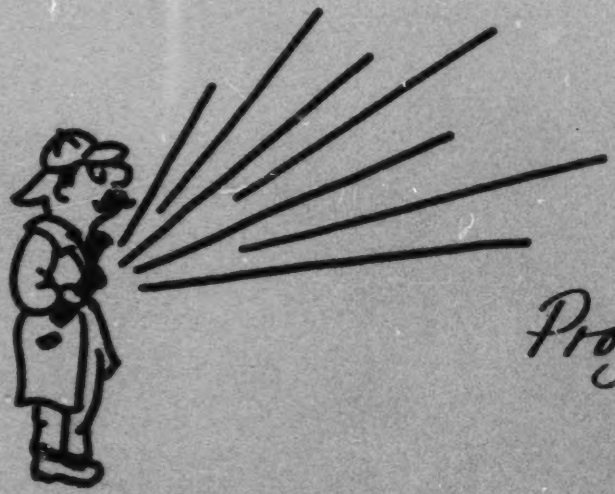

Project Search

1975

Draft Copy

SE 021 930

FORWARD

This Articulated Curriculum is being printed and bound in this manner to provide for on-going revision. This also serves as evidence of work completed during Phase III of Project SEARCH.

SCIENCE

K - 12

LIVING THINGS ARE PRODUCTS OF
THEIR HEREDITY AND THEIR ENVIRONMENT

ACKNOWLEDGEMENTS

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PROJECT SEARCH

ARTICULATED CURRICULUM

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August 1975

MRS. ROSE DANELLA and NORMAN I. SIEGEL, both former Board Members deserve special mention for all their efforts on behalf of Project SEARCH.

UTICA CITY SCHOOL DISTRICT
13 Elizabeth Street
Utica, New York 13501

SCIENCE

LIVING THINGS ARE PRODUCTS OF THEIR HEREDITY AND THEIR ENVIRONMENT

The student will know:

The student will:

Grade K

- that all things are either living or non-living
  - classify pictures into two groups-living and non-living
- that living things can be plant or animal
  - from a table with a rock, a plant, and a goldfish, compare differences and similarities, e.g. which are alive? Why? What characteristics are peculiar to living things?
- that there are many kinds of plants and animals
  - name three plants.
  - name three animals, classify them as fur bearing, wild, etc.

Grade 1

- that there are differences between living
- or non-living things.
  - list living and non-living things in the environment
- that there are differences between plants and animals
  - compare and contrast the differences of plants and animals
- that there are many kinds of plants.
  - name several types of plants from given pictures. Compare size and flowers if any.
- the main parts of plants
  - identify the parts of plants and illustrate each.
- that there are ways animals move.
  - act out designated animal movements, such as flying, swimming, hopping, running, crawling, and walking.
- that there are many kinds of animals.
  - name several different kinds of animals and describe and compare each by size, sounds made, movements and outer covering.

SCIENCE

- that living things are plant or animal
- that living things reproduce their own kind
- that living things have a life cycle.
- that without nourishment all living things would die
- that plants make food.
- that animals depend on plants for food.

LIVING THINGS ARE PRODUCTS OF THEIR HEREDITY AND THEIR ENVIRONMENT

Grade 2

- categorize and label pictures of living things as being plant or animal.
- make a list of living things as plant or animal.
- match pictures of baby animals with their mothers.
- draw and label the life cycle of a marigold seed from seed to small plant to flower to seed.
- compare life cycle of two plants, one given proper care, one deprived of water and light.
- list two factors necessary for plants to make food .
- name 2 animals and list the plants they eat or trace their food supply to plant life.
- trace human dependence on plants and other animals for survival,i.e. housing, clothing, food.

SCIENCE	LIVING THINGS ARE PRODUCTS OF THEIR HEREDITY AND THEIR ENVIRONMENT Grade 3
- that all things are living or non-living	- identify from a set of things those which are living and those which are non-living and describe characteristics of each.
- that living things are plant or animals.	- classify a group of items as plant or animal. - list 4 ways in which plants are alike and 4 ways that animals are alike. - compare and contrast similarities and differences of plants and animals.
- that living things need food, water and air to stay alive.	- describe what happens to a plant deprived of air or water or food.
- that some plants make their own food (plants can be green or non-green)	- name 5 plants that make their own food and 3 that do not.
- that animals are vertebrate or invertebrate.	- classify a set of animals as vertebrate or invertebrate.
- that vertebrate animals are either mammal, fish, amphibian, bird, or reptile.	- list the classes of animals with backbones and give examples of each.
- that each group of animals has characteristics which differentiate it from the other groups.	- be able to list characteristics peculiar to each group i.e. reproduction, warm and cold-bloodedness, etc.
- that the systems of the body perform specific functions to enable survival.	- list 3 body systems. Write 2 sentences about each, 1 sentence to describe the work of the system, the second to tell how the system contributes to survival.

SCIENCE	LIVING THINGS ARE PRODUCTS OF THEIR HEREDITY AND THEIR ENVIRONMENT Grade 4
- that living things (plants) are produced by similar living things. - that living things (animals) are produced by similar living things.	- trace the life cycle of a seed plant. - illustrate how plants can be grown from leaves or stems of other plants or bulbs. - trace the life cycle of a bird from embryo to adult and illustrate each stage,
- that living things depend on other living things for their food.	- state where a given organism belongs in a food chain. - illustrate plants that make their own food, and those that do not. - explain the interdependence of plants and animals.
- that different living things are adapted to different environments.	- compare the ways in which a fish is adapted to its environment with the ways in which a bird is adapted to its environment.
- that living things can reproduce themselves and develop in a given environment - living things are made up of and grow by cell division.	- list the 6 conditions necessary for a favorable environment for a particular animal. - illustrate cell division by a series of pictures.

SCIENCE

LIVING THINGS ARE PRODUCTS OF THEIR HEREDITY AND THEIR ENVIRONMENT

Grade 5

- that the cell is the smallest living part of a living thing (plant or animal)
- draw pictures of plant and animal cells and label each. Show differences between plant and animal cells
- that cells use food and oxygen to produce energy for growth and movement.
- make a diagram explaining how cells use food to produce energy.
- that cell division is a method by which a cell divides to produce two similar cells.
- write a paragraph describing the division of the nucleus (cell division).
- that the smallest animals are composed of a single cell, while larger animals are composed of millions of cells.
- identify from a list which animals are one celled and which are many celled.
- that a living thing develops from a single cell.
- explain the states of development from the fertilized egg stage of a frog to a full grown frog.
- that cells are specialized for different functions.
- state in writing how the following cells are specialized; red blood cells, white blood cells, nerve cells, and muscle cells.
- that groups of cells and tissues are organized into body organ systems, specialized to perform body functions.
- cite several body organ systems and write reports on the body functions of each. e.g. digestive system--write a report on the digestive process.

Grade 6

- that in all forms of multi-cellular life two special cells are needed to start new life.
- explain the following terms:
  a. reproduction
  b. fertilization
  c. ovum
  d. sperm
  e. pistil
  f. stamen.
- that in the reproduction of a fish, the egg cells are fertilized by sperm cells outside the body of the female
- describe the reproductive process of fish.
- that in the reproduction of birds, the sperm cells fertilize the egg cells inside the female body
- describe the reproductive process of birds.
- differentiate the reproductive process of birds and fish.
- that in the reproduction of seed plants, the stamen is fertilized by the pistil.
- illustrate the reproduction of seed plants.

SCIENCE

LIVING THINGS ARE PRODUCTS OF THEIR HEREDITY AND THEIR ENVIRONMENT

Grade 6 (cont'd)

- that in the reproduction of mammals (including humans) the sperm cell fertilizes the egg inside the female's body.
- that living things reproduce their own kind.
- that one of the important reasons families exist is to take care of their young and teach them the things they need to know in order to grow and live in our world.

- write a report on the reproductive processes of mammals.
- construct Mendel's law and give one example.
- list different ways families take care of their young.

SCIENCE

LIVING THINGS ARE PRODUCTS OF THEIR HEREDITY AND ENVIRONMENT
LIVING THINGS IN CONTINUOUS CHANGE
INTERDEPENDENCY OF LIVING AND LIVING THINGS WITH THE ENVIRONMENT

Health

Grade 7

The student will know:	The student will:
- that heredity prescribes the potential for growth and development of the human organism	- define the term heredity - list some physical characteristics which humans inherit - identify and describe practices and conditions in a person's environment which can affect growth and personality.
- that each individual is a unique biological entity.	- compare similarities and differences in the physical characteristics of people living in various environments - deserts, mountains, tropics, etc. - prepare a chart listing height, color of skin, hair and eyes and general body build noting how people differ because of environment.
- that basic laws of heredity regulate inherited factors	- define the terms dominant and recessive traits. - prepare (construct) a genetic chart using appropriate symbols, to demonstrate Mendel's 3:1 ratio with regard to inherited traits such as eye or hair color, and to show mathematical frequency in manifestation of dominant and recessive traits. - prepare a brief oral report on the life and work of Gregor Mendel and/or modern authorities in the field of genetics. - demonstrate, and keep a record of the laws of probability operational in the flipping of two pennies, 100 times, with heads and tails representing two different traits. compare their records with other students in the class and discuss the results.

SCIENCE	LIVING THINGS ARE PRODUCTS OF THEIR HEREDITY AND ENVIRONMENT LIVING THINGS IN CONTINUOUS CHANGE INTERDEPENDENCY OF LIVING AND LIVING THINGS WITH THE ENVIRONMENT
	Health Grade 7
- that mutations take place in genes, are rare, but can be controlled by man for specific purposes.	- report on the effects of certain chemical and excessive radiation (x-rays and nuclear on chromosomes.) - write a report on suspected damage to human chromosomes by LSD and marijuana - research data on bodily changes in survivors of Hiroshima. - list desirable mutations man has accomplished through experimentation - such as, polled cattle, seedless watermelons, purebred dogs, etc.
- that some types of bacteria, viruses and parasites cause diseases in man.	- define the terms bacteria, virus, and parasite. - state the difference between bacteria, viruses and parasites. - identify microscopic slide preparations of bacteria and parasites, and photomierographs of viruses.
- that bacteria depend upon plant and animal cells for food in order to grow and proliferate.	- describe the conditions which lead to milk spoilage in the process of milk souring and the process of bacterial nutrition and growth in the process.
- that some bacterial types are harmful to man and cause diseases, but most kinds are beneficial to man.	- construct a table showing how some bacteria can be necessary and beneficial to man - prepare a written report on one industry that depends on "good" bacteria for production of a consumer product.
- that disease producing bacteria grow in living cells and kill them off by waste products or toxins that are produced. - that disease producing bacteria can be microscopically identified by 3 basic shapes- ball, rod, and spiral shaped.	- prepare a written report on one bacterial caused disease describing the physical symptoms of the disease, and its course. - draw or construct a model of each of the 3 major bacterial shapes and tell 1 disease caused by each type.

SCIENCE

LIVING THINGS AS PRODUCTS OF THEIR HEREDITY AND ENVIRONMENT
LIVING THINGS IN CONTINUOUS CHANGE
INTERDEPENDENCY OF LIVING AND LIVING THINGS WITH THE ENVIRONMENT

Health — Grade 7

- that viruses, much smaller than bacteria can also grow and reproduce in a living cell.	- define and describe a virus and prepare an oral report on the role viruses play in causing diseases.
- that parasites are organisms that depend on other living things for food, and can therefore cause illness.	- identify the specific parasites causing malaria, ringworm, trichinosis, tapeworm, athlete's foot, and pediculosis, and demonstrate the physical manifestation and reactions to each of these diseases.
- that protozoans of a harmless nature can commonly be found in waste and can be distinguished from harmful ones by certain characteristics.	- examine a drop of pond water to observe different kinds of protozoans. - draw a specific kind of protozoan seen.
- that all disease producing parasites can be contracted directly through contaminated human and animal carriers.	- research and write a case-history report of a disease explaining the step-by-step circumstances under which the disease was contracted.
- that good health habits must be practiced by everyone to prevent the spread of disease germs and the illnesses they carry; at home, at work, at school, at play.	- prepare a chart listing 3 good health practices to be followed in each of the given places, in order to minimize the spread of disease.
- that causes and prevention of diseases is a world-wide problem and task.	- participate on a committee to collect newspaper and magazine clippings and articles on diseases and report findings to the class.
- that many diseases can be prevented through the use of vaccines.	- construct a disease and vaccination record which will include all diseases contracted, and diseases for which he has been vaccinated and the dates.
- that human beings behave the way they do because they are trying to satisfy important human needs.	- list important human needs that all individuals have. primary or physiological needs secondary or psychological (emotional) needs participate in role playing (Bomb Shelter)

SCIENCE	LIVING THINGS AS PRODUCTS OF THEIR HEREDITY AND ENVIRONMENT LIVING THINGS IN CONTINUOUS CHANGE INTERDEPENDENCY OF LIVING AND LIVING THINGS WITH THE ENVIRONMENT
Health	Grade 7
- that success or failure in satisfying one's needs depends on kind and amount of learning, social influences, and personal qualities.	- cite some outstanding personalities in many fields. - write a report on one outstanding person that will include their strengths and weaknesses, and how these affected their success.
- that frustration results from failure to satisfy a need, solve a problem, attain a goal because of personal and environmental obstacles.	- describe how failure to have human needs met can affect behavior. - collect magazine and newspaper clippings about problems involving teens and write a paragraph on some possible solutions to their problem.
- that a mature way to reduce frustration in meeting one's needs is to try the problem-solving approach.	- list important steps in the problem-solving method. - make a list of things that bother him and write a paragraph for each problem telling how he might solve it.
- that every human being has a personality which is the sum total of all one's characteristics.	- discuss what is meant by personality. - define the term "personality". - list 5 aspects of the personality and tell how each can be developed. - list characteristics of a "good" and "bad" personality. - construct a "ME" poster or model.
- that personality develops through an interplay of genetic and environmental factors.	- give examples of how heredity and environment may help shape one's personality. - construct a family tree as far back as grandparents, and list some physical traits inherited from parents and grandparents; include behaviors and likes and dislikes he feels he shares with parents and grandparents.

SCIENCE	LIVING THINGS AS PRODUCTS OF THEIR HEREDITY AND ENVIRONMENT LIVING THINGS IN CONTINUOUS CHANGE INTERDEPENDENCY OF LIVING AND LIVING THINGS WITH THE ENVIRONMENT
Health	**Grade 7**
- that just as the body grows and changes one's personality can keep growing and changing.	- discuss the rate at which girls and boys reach physical maturity and develop realistic plans for one's own personality growth. - construct a graph or growth chart illustrating his physical development from birth to the present. - compare and discuss growth patterns of boys and girls in class. - plan and execute a panel discussion on the topic "Can One Improve His Personality, and If So, How?" - research and report on his tentative future career, and tell what personality characteristics are desireable to obtain and maintain that career.
- that coping with strong emotions and satisfaction of emotional needs help to determine how the personality will develop.	- define the term emotion; give some examples. - list some emotional needs people have. - discuss some constructive ways of coping with strong emotions. - clip and mount magazine and newspaper clippings of people demonstrating some emotion and identify the emotion.
- that emotions can affect body functioning.	- tell how emotions can affect body functioning. - define the term psychosomatic disease. - list some disorders classified as psychosomatic. - give oral presentation illustrating how a strong emotion can affect physical functioning (butterflies in stomach, etc.)
- that mental health involves the ability to accept ourselves and other people, and to be able to meet life's demands: it is influenced by many factors - family, friends, etc.	- evaluate the traits of a mentally healthy individual and list some aids in achieving good mental health.

SCIENCE

LIVING THINGS As PRODUCTS OF THEIR HEREDITY AND ENVIRONMENT
LIVING THINGS IN CONTINUOUS CHANGE
INTERDEPENDENCY OF LIVING AND LIVING THINGS WITH THE ENVIRONMENT

Health

Grade 7

- discuss a TV family situation comedy in the light of affection, security and recognition.
- list leisure-time hobbies and interests.
- write a paragraph on how he can promote more harmony in the family and school.

SCIENCE

LIVING THINGS ARE PRODUCTS OF THEIR HEREDITY AND ENVIRONMENT
INTERDEPENDENCY OF LIVING AND LIVING THINGS WITH THE ENVIRONMENT

Health — Grade 7

The student will know:	The student will:
- that accidents increase with the approach of the teen years because people in this age group acquire more independence and begin participating in new activities.	- tell why safety instruction is more important in junior high, and identify the chief causes of accidents in these years. - list 5 accidents common to the 8-15 age group and tell possible reasons for their occurrence. - draw a graph illustrating the rise and fall of kinds of accidents and rates between the ages of 4-14 years.
- that the home is the number one place where most accidents - chiefly falls - occur.	- cite specific ways of making the home safe for the family, and describe safety guides that prevent home accidents. - prepare a list of 10 potential safety hazards in the home, and suggest ways in which they may be eliminated or modified. - give one example of a home emergency and what steps one could/should take to handle it.
- that accidents in school accelerate at the junior high level.	- list hazards of unsafe actions in the halls, gym, shop, laboratories, and other school areas. - recite rules for behavior in school corridors and on school grounds and tell why they are necessary. - draw safety posters and prepare safety slogans that can be posted throughout the various school areas.
- that teen-agers can learn what to do in such emergency situations as fire, nosebleed, choking, severe bleeding and fainting.	- describe some simple first-aid procedures. - demonstrate proper procedure and technique for minimizing or stopping the following: nosebleed, fainting, choking, severe bleeding. - demonstrate correct behavior in the event of a school fire drill.

SCIENCE

LIVING THINGS ARE PRODUCTS OF THEIR HEREDITY AND ENVIRONMENT
LIVING THINGS IN CONTINUOUS CHANGE

Health

Grade 7

The student will know:	The student will:
- that the body requires food and nutrients to (a) carry on vital functions, (b) build new cells and tissues, and repair those that wear out, (c) supply energy for physical activities, and (d) assure total physical and mental fitness.	- cite the important functions of food in the body. - discuss the fact that the human body and foods are composed of the same chemical elements: prepare a chart listing and comparing the elements composing living protoplasm and chemical elements that are found in various foods. - tell why a variety of foods is needed in a daily diet. List the major nutrients and relate each to specific body tissues that require them. Using vitamin and mineral charts as guides, check various food packages to determine which are included in the foods. Compare lists with other students. - explain some effects of emotions on appetite.
- the human body is equipped to digest, absorb, and assimilate nutrients obtained from food.	- explain the process of food digestion and assimilation by the body. - list the organs of digestion and state what each one does in the digestive process.
- too many or too few calories may result in poor health.	- explain what is meant by a calorie. prepare a list of foods eaten in one day. check a calorie chart to determine number of calories in each of the foods and total them. maintain a notebook of foods eaten and caloric values for future comparison and reference.
- an individual's caloric needs are determined by body size, sex, rate of growth, physical activity and basal metabolism.	- obtain weight and height data of 5 seventh and 5 tenth graders; make a chart or graph to compare changes which have occurred in the ensuing period of time. - compare caloric intake of students in class noting high and low intakes. Make and compare averages of boys' and girls' intakes.

SCIENCE

LIVING THINGS AS PRODUCTS OF THEIR HEREDITY AND ENVIRONMENT

LIVING THINGS IN CONTINUOUS CHANGE.

Health — Grade 7

- the Basic Four Food Group is a guide for foods to be eaten to provide an adequate diet.
- rapid growth and development during adolescence demand that adequate nutrition be adhered to by teen-agers for their long term good health, appearance, and well-being.

- list all activities engaged in a 24 hour period; compare number of calories needed for completion of each activity with one's daily calorie intake.
- describe what is meant by basal metabolism.
- arrange for demonstration by local hospital laboratory worker to explain reason and procedure of a basal metabolism test.
- construct a poster illustrating the foods contained in each of the four basic food groups.
- compile a list of foods eaten in a 24 hour period and compare their lists to the Basic Four Food Chart to see if individual daily requirements have been met.
- prepare a report on some common food fad and fallacy that may keep teenagers from getting an adequate diet.
- research one popular fad diet and analyze it for nutritional adequacy using the Basic Four Food Guide.
- interview a school doctor, family doctor, or a dietician to explain precautions a person should take before dieting to lose weight and the effects of severely inadequate diets on one's health, and report his findings to the class.

SCIENCE

LIVING THINGS ARE PRODUCTS OF THEIR HEREDITY AND ENVIRONMENT

General Science — Grade 7

The student will know:	The student will:
- that a classification system is used to separate types of animals.	- list the phylums found in a classification of animals. - from the characteristics determined from a list by pictures, animals found in each phylum.
- each animal has an optimum temperature in which it exists.	- list various types of climates that animals live in. - list animals found in each climate above. - from the evidence in the above, correlate temperatures and animals found in these climates.
Digestive system: - the major classes of nutrients, foods found in and their functions in the human body.	- list the major classes of nutrients. - describe what these nutrients are used for in the body. - be able to divide "foods" into their nutrient "classes".
- the major organs of the digestive system and their functions:	- name the organs and glands of the digestive system. - give the functions of these organs and their effect on the foods being digested. - be able to locate and recognize these organs during dissections of frogs or calves viscera.
Circulatory System: - that blood is a tissue	- view various types of blood under a microscope and name the various cells present and give their function.
- there are various types of vessels to carry this tissue.	- be able to locate arteries, veins, and capillaries on their own bodies.
- that the heart is a pump which pushes blood around the body.	- demonstrate the increase and decrease of heart beat during activity by taking one's pulse rate before and after exercise. - be able to locate and name the chambers of the heart and recognize their functions during dissection

SCIENCE

LIVING THINGS AS PRODUCTS OF THEIR HEREDITY AND ENVIRONMENT

General Science

Grade 7

Excretory System: - that the human produces wastes during the processes of digestion and respiration.	- list the 3 states of matter and the waste products from the body which is each one of these states. - name the organs of excretion and each of the products and where these products are formed.
Respiratory System: - how and why air enters the lungs. -why this process is necessary for the life functions.	- demonstrate with a bell jar model of the lungs how they operate, being able to explain how air pressure effects the lung operation. - list the reasons why this process is necessary for the living organism.
Skeletal and Muscular Systems: - how the skeletal system supports and protects the body and the muscles help the bones to move.	- be able to demonstrate how each motion of the body (bones) are accompanied by two muscle movements.
Brain and Central Nervous System: - how the brain gathers information about its surroundings from the 5 senses.	-experience and be able to demonstrate how various stimuli applied to different senses can effect what information the brain can gather from its surroundings.
- what effect the brain has on the living organism.	- be able to trace various animal phylums and compare their central nervous systems to the organisms behavior and adaption to its environment.
- how the central nervous system controls the movements and functions of the body.	- be able to list the major parts of the central nervous system and their function and the relationship to the brain and body as a whole.

SCIENCE

LIVING THINGS AS PRODUCTS OF THEIR HEREDITY AND ENVIRONMENT

General Science — Grade 7

- that plants obtain some of their characteristics through heredity and some of their characteristics from their environment.
  - define: heredity, nucleus, chromosome, environment, Gregor Mendel, genes.
  - construct a Punnettsquare and show the probability of certain characteristics arising.
  - define: the words dominant gene, recessive gene, homologous chromosomes, alleles.
  - list the materials provided by the environment needed for plant survival.
  - write out diseases which may affect a plant if the proper environmental factors are not provided.

Health — Grade 7

The student will know:	The student will:
- that the cell is the basic unit of structure in the body; cells differ in their structure because of the different tasks they perform in the body.	- describe the anatomical make-up of a cell. - correctly draw and label a drawing of a cell with its four major parts. - construct a model of one type of cell found in the human body. - identify and state the tasks of five different kinds of cells.
- tissues are made of similar cells grouped together to perform specific functions.	- identify five major tissue types and state the functions of each.
- body organs are composed of various tissues, and are grouped into body systems which carry on important body functions.	- tell what is meant by a body organ and a body system and explain the activities carried on by each of the body systems. - dissect a preserved sheep's eye and identify various tissues that compose it. - dissect a preserved bullfrog and point out some major organs and systems in it. - prepare a sample blood smear and with use of a microscope, distinguish between red and white blood cells.

SCIENCE

LIVING THINGS AS PRODUCTS OF THEIR HEREDITY AND ENVIRONMENT

Health

Grade 7

- research one organic disease and state how it affects overall body function.

- that teen-agers tend to imitate adult behavior, and view drinking and smoking as "adult" behavior.

- identify some of the factors that cause young people to smoke or drink.
- conduct a secret poll of their friends to find out how many have tried smoking cigarettes and drinking alcoholic beverages and if so, what their reasons were for doing so.
- prepare a classroom discussion on the reasons teenagers smoke and drink.
- cut out magazine advertisements for cigarettes and alcoholic beverages and discuss the aspects of smoking and drinking that they emphasize.

- smoking is the factor in the development of heart diseases, and diseases of the respiratory system.

- explain why smoking is hazardous to health and describe what happens when cigarette smoke enters the body and is drawn into the lungs.
- point out organs of respiration and their location on an anatomical chart, and cite the functions of each.
- locate the coronary vessels on a heart model, and
- explain their purpose.
- demonstrate the effects of smoking on human lungs with the aid of a mechanical smoking machine.
- learn and demonstrate proper way of taking pulse; elicit cooperation of smoking family members or friends to agree to act as subjects in attempts to correlate effects smoking has on heart rate.

- excessive use of alcoholic beverages interfere with muscular coordination and judgement, and aggravates social problems.

- tell about some effects of alcohol on the body and explain the special hazards of alcohol to personal health and social interaction.

SCIENCE	LIVING THINGS AS PRODUCTS OF THEIR HEREDITY AND ENVIRONMENT	
Health		Grade 7
		- draw a model of the human brain and indicate those areas affected by drinking varying amounts of alcoholic beverages. - collect newspaper clippings of accidents involving use of alcohol. - define the terms: social drinker, problem drinker, abstainer, alcoholism. - make a list of nonalcoholic drinks suitable for social occasions. - conduct research and prepare a graph showing relationships between accident rates and drinking.
- drugs, when properly used, may improve, cure, or prevent some physical or mental ailment.		- discuss the fact that some drugs can be helpful. - write a report of some recent illness in which some drug was used to alleviate discomfort and promote a cure. - review drug labels and list conditions under which the drug may be used and for what purposes.
- drugs can be misused or abused when taken without medical supervision.		- define prescription and non-prescription drug. - distinguishes between use and abuse of drugs. - prepare a written survey of TV commercials concerned with drugs, and explain what is said or implied in the commercials.
- that three main groups of drugs most commonly abused are depressants, stimulants, and hallucinogens. - drug addicts are people with personality problems		- list the most common non-prescription drugs. - list the three main groups of drugs most commonly abused and explain the effects each of these has on the body. - prepare a panel discussion on drug abuse citing the reasons that people have for misusing drugs. - draw posters and cartoons on possible reasons and dangers of drug abuse. - prepare bulletin board displays of magazine and newspaper clippings related to drug use and abuse.

SCIENCE	LIVING THINGS AS PRODUCTS OF THEIR HEREDITY AND ENVIRONMENT
Health	Grade 7
- development of desireable habits contributes to a person's health, effectiveness and efficiency, while undesireable habits result in poor health, ineffectiveness and inefficiency.	- prepare a chart listing good habits as opposed to bad habits, and explain how some of them promote good health and harmonious social relations, and how those listed as bad bring about poor health and social problems.
Biology	Grade 10
- the structure and functions of the cell.	- state and explain the three components of the cell theory. - compare and contrast the processes involving dehydration synthesis and hydrolysis. - label and describe the functions of the organelles in a typical cell. - describe the functions of the cell nucleus. - compare and contrast the plasma membrane and the cell wall. - explain why it is important that the cell membrane is a semi-permeable membrane. - describe the process of diffusion through a semi-permeable membrane and indicate the direction a substance will move relative to its concentration. - describe the process of osmosis. - compare and contrast passive transport and active transport. - compare and contrast cells, tissues, prgams. systems, organisms, populations, communities, biomes, and biosphere.
- the past and present beliefs concerning how living things reproduce.	- explain what is meant by the term spontaneious generation. - define mitosis as the process of nuclear replication

- label a diagram of the four phases of mitosis, identify the various structures, and explain what happens in each phase.
- explain how the process of mitosis guarantees genetic continuity.
- differentiate between the diploid and the monoploid number of chromosomes.
- indicate that humans have 23 pairs of chromosomes.
- compare and contrast zygote, sperm, and egg.
- compare and contrast the process of meiosis and the process of mitosis.
- compare and contrast the process of meiosis in the development of sperm and the development of the egg.
- explain how the process of meiosis provides for variation among offspring.

- genetics and the methods used to determine genotypes and phenotypes of parents or offspring when knowledge of one or the other is available.

- define genetics as the study of heredity.
- differentiate between the F_1 generation and the F_2 generation.
- state Mendel's law of segregation.
- compare and contrast dominant and recessive traits.
- describe a Punnett square and demonstrate its use in determining the possible combinations of characteristics among offspring.
- compare and contrast genotype and phenotype.
- differentiate between homozygous and heterozygous.
- explain what is meant by incomplete dominance.
- state the law of independent assortment.

SCIENCE

Biology

LIVING THINGS AS PRODUCTS OF THEIR HEREDITY AND ENVIRONMENT

Grade 10

- gene expression, combination, and location on the chromosomes and how these factors affect offspring phenotype.

- describe an example in which a trait is governed by more than two alleles and demonstrate that only two alleles act together to produce the trait in an organism.
- differentiate between the X and Y chromosomes and their role in sex determination.
- explain what is meant by the term "sex linked characteristic" and describe an example of a sex-linked characteristic.
- state and explain the chromosome theory of heredity.
- describe an example of nondisjunction during meiosis.
- explain how linked genes reduce the changes for genetic recombination and variety among offspring.
- explain how crossing-over tends to increase variety among offspring by separating linked genes.

- some of the patterns of reproduction found in living things.

- define asexual reproduction and indicate that it is accomplished by mitosis.
- compare and contrast regeneration, budding, runners, and bulb formation as examples of vegetative propagation.
- compare and contrast fission in asexual reproduction and fusion in sexual reproduction.
- compare and contrast the life cycles of mosses and ferns.
- label a diagram of a flower, identify the various parts, and describe the function of each part.
- compare and contrast self-pollination and cross pollination.
- differentiate between testes and ovaries in animals.
- compare and contrast external fertilization and internal fertilization.
- describe the human menstrual cycle and explain how hormones control this cycle.

SCIENCE

LIVING THINGS AS PRODUCTS OF THEIR HEREDITY AND ENVIRONMENT

Biology

Grade 10

- embryology and the changes through which an organism attains a final form.

- define embryology.
- compare and contrast complete metamorphosis and incomplete metamorphosis.
- describe the functions of the placenta and umbilical cord in the development of an embryo in placental mammals.
- compare the number of eggs produced by animals in which the embryos develop externally and the number produced by animals in which the embryos develop internally and suggest possible reasons for the difference.

Physical Science

Grades 10 - 11

The student will know:

- that the environmental conditions predetermine that kind of matter which forms in various areas.

- that chemicals which can be decomposed by bacteria are known as soft or biodegradable substances

The student will:

- list all the various forms of matter (living and non-living) and assign the environmental conditions that are best for a particular type of growth.
- experiment on various samples brought in from the area.
- explain how dangers from many chemicals lie on their cumulative effect.
- compare the corrosion of a nail by distilled water, and by water samples having low or high pH values.
- list the various kinds of detergents and compare them as to biodegradability.
- demonstrate the immiscibility of oil and water.
- show how self purification of water depends upon time and temperature.

Science

LIVING THINGS AS PRODUCTS OF THEIR HEREDITY AND ENVIRONMENT

Biological Science

Grades 10 - 12

The student will know:	The student will:
- life comes from previous life.	- observe tubes of beef soup that have been treated differently looking for signs of life.
- a population can multiply very slowly.	- make a geometric calculation showing the growth of a penny and observe an overpopulated tube of bacteria.
- some organisms reproduce by dividing, a method requiring only one parent (asexual)	- observe the reproduction of ameba, paramecium, yeast, hydra, and onion root cells.
- in sexual reproduction, 2 cells are involved and the offspring do not look like the parents.	- dissect a flower and observe the growth of pollen tubes.
- venereal disease is a serious problem of epidemic proportions.	- Observe VD: A New Focus - a film- and discuss it with teacher and in small groups.
- a pattern of inheritance can be observed over a period of generations.	- observe 3 generations of bean seeds, and construct a pedigree chart.
- the pattern of inheritance can be predicted	- examine 3 generations of pea seeds, and compare the pattern of inheritance of the peas with the pattern observed in the beans.
- the environment can affect the appearance of an inherited feature.	- observe 3 dishes of tobacco seedlings, each grown under different environmental conditions.
- each offspring receives some evidence for each feature from each parent.	- use colored chips to represent the genotype of various parents and offspring.
- one bit of information can dominate and hide another piece of evidence.	- analyze the reason for the pattern of inheritance using brown and clear plastic chips, he will observe the difference between recessive and dominant traits.
- you can determine the odds on the features' an offspring will inherit.	- use coins to develop some basic rules of probability and then determine some inherited human features.
- a bit of information can direct the activities of a cell.	- apply drops of liquid from crushed smooth peas and wrinkled peas to a Petri dish of sugar agar.
- the hereditary bits of information are carried on the chromosomes.	- make a human chromosome karotype in aiding him to realize that chromosomes determine heredity.

SCIENCE

LIVING THINGS AS PRODUCTS OF THEIR HEREDITY AND ENVIRONMENT

Health

Grades 11-12

The student will know:	The student will:
- the values of and the need for good nutrition for total fitness.	- list the physical and mental signs of a person who is well nourished. - define malnutrition, kwashirkor and vitamin deficiency diseases. - post pictures showing starving children in various parts of the world. - compare the required quantities of nutrients and how they vary for each individual based on his sex, age, growth, activity and environment with the understanding that all people need the same nutrients. - collect all information on various reducing diets and analyze diets in relationship to adequate nutrition.
- the nutritive value of foods and individual requirements for attaining and maintaining optimal health.	- make charts in bar graph form to show for example, the amount of protein in various protein rich foods. - discuss the factors which influence adolescent eating habits. - investigate the relationship between calorie intake and exercise. - discuss influence of nutrition on embryological development and child growth. - compare opinions on breast feeding an infant. - research the problem of cholesterol and atherosclerosis. - list foods that are low in cholesterol.
- that many food fads and fallacies exist to influence individual and group health status.	- determine the validity of the "organic" food movement. - evaluate magazine and newspaper articles dealing with additives, pesticides, and radioactive fallout in foods.

SCIENCE

LIVING THINGS AS PRODUCTS OF THEIR HEREDITY AND ENVIRONMENT

Health

Grades 11-12

- foods may contain substances that are harmful to our bodies.
- nutritional problems may affect international relations.
- most communicable diseases follow a characteristic pattern of development.

- compile a list of factors that influence consumers in their food purchases.
- collect food advertisements and evaluate them in terms of nutrition and cost.
- report on laws which protect the consumer. Use labels from products as examples.
- select several food fallacies and outline scientific reasons why they are fallacies.
- investigate the ways that diseases are transmitted by foods. Discuss methods of prevention.
- compile a list of foods that are naturally harmful or poisonous to humans.
- list the food additives that are commonly used.
- study food habits and problems of other countries. Show relationship of nutrition to the political and economical problems.
- discuss outcome of "food conference" in Rome, Italy, 1974.
- list the causative agents of disease.
- define the following: incubation period, prodromal period, fastigium, defervescence, convalescence, defection period.
- name the methods by which disease is transmitted.
- list the ways by which organisms enter into the body.
- describe the body defenses against disease.
- make a chart showing causative agent, mode of transmission, entry, incubation period, signs and symptoms, treatment and prevention of the following diseases: gonorrhea, syphilis, infectious mono-hepatitis, tuberculosis.
- perform experiments culturing pathogens.

SCIENCE	LIVING THINGS AS PRODUCTS OF THEIR HEREDITY AND ENVIRONMENT
Health	Grades 11-12
- the specific measures used to prevent and control or combat diseases.	- check his immunization record. - discuss the effectiveness of each of the following as detriment to disease control: quarantine, purification of water supply, eradicating dangerous mosquitos, disposal of human waste. - investigate and report on specific ideas which individuals might use to prevent or control communicable disease and chronic disease. - report on the work of Pasteur and Koch. - report on reservoirs of disease. - investigate and evaluate the function of the County Health Department, in its relationship to disease prevention and control. - research and report on the new scientific devices used to treat and diagnose disease.
- that community health, as a key to success in achieving the individual goals, is everyone's responsibility. - that cancer disease is characterized by abnormal uncontrolled growth of cells.	- research and explain health problems and community resources available to aid people of the community. - examine prepared slides of cancerous tissues. - test themselves and each other on knowledge of seven warning signs of cancer.
- cancer is curable, providing it is diagnosed early. - medical science has made great strides in improving diagnosis and treatment of cancer patients.	- ~~do a study on incidence of~~ cancer and cure rates for various types of cancer. - report on the work of Dr. George Papanicolaou. - discuss approved methods of cancer treatments. - discuss the use of unapproved drugs, unethical treatments and quackery with cancer patients.
- cardiovascular disease is a major physical and psychological health problem.	- review the circulatory system. - graph the following: extent of cardiovascular disease in comparison to other diseases; cardiovascular diseases in various countries of the world; increases in types of cardiovascular disease.

SCIENCE

LIVING THINGS AS PRODUCTS OF THEIR HEREDITY AND ENVIRONMENT

Health

Grades 11-12

- health habits affect the risk factor of cardiovascular disease.
  - develop a bulletin board on risk factors of cardiovascular disease.
  - discuss each of the following on the cardiovascular system: smoking, diet rich in cholesterol, alcohol, stress and heredity.
- that there are many agencies which assist in the prevention and control of cardiovascular disease.
  - discuss the work of the local Heart Association.
- a number of long term illnesses may begin during young adulthood.
  - research the following listing causes, signs, symptoms and treatment of:
    - rheumatic fever
    - diabetes mellitus
    - allergies
    - high blood pressure.
- that heredity and all the environments, biological, physical, social and cultural, help mold and change the many characteristics and behaviors of the individual.
  - define the following words:
    - ecosystem
    - non-living environment
    - eutrophication
    - recycle
    - biodegradable
    - thermo-pollution
    - temperature inversion
    - pesticides.
  - discuss how attempts to solve existing pollution problems have led to the possibility of man's living in a new environment.
  - investigate various methods of desalinization of sea water.
  - visit a water treatment plant and write a report on its operation.
  - investigate old and new state and federal laws regarding pollution.
  - report on the local health department's rodent control.

SCIENCE

LIVING THINGS AS PRODUCTS OF THEIR HEREDITY AND ENVIRONMENT

Health

Grades 11-12

- the impact of economic, demographic, social, cultural, scientific and technical changes, have not only improved man's health, but also created additional health needs, and a number of ecological problems.
  - make a chart showing noise levels of various activities
  - report on land fill operation in the city.
  - investigate the city of St. Louis method of waste disposal.
  - investigate population and human well-being.
  - make a chart showing growth or world population in the last 50 years.
  - list the four sources of radiation.
  - research the dangers of radiation in the environment.
  - list the number of nuclear power plants in the country.
- that all men have a responsibility in maintaining the ecological balance on earth.
  - support and cooperate with all activities that will control population.
  - act as responsible citizens when anti-pollution laws are violated.
- that the factors which lead to drug addiction are varied and complex
  - report on why people abuse drugs.
  - survey people on the reasons why they start smoking and continue the smoking habit.
  - explain the principles which operate in group settings to determine an individual's behavior.
  - list the agencies which can help people who are addicted to drugs.
- and understand the nature of drugs, the benefits of their use, and consequences of their abuse.
  - explain the basis for and history of legal controls on drug use.
  - list the differences and similarities between stimulants, depressants, hallucinogens and narcotic depressants.
  - compare the different medical classes of drugs with respect to their source, methods of us, and effect.
  - report on the physical and social value of drugs.
  - evaluate myths, beliefs and information on drugs to establish a sound basis for decision making.

SCIENCE	LIVING THINGS AS PRODUCTS OF THEIR HEREDITY AND ENVIRONMENT	
	Health	Grades 11-12
		- list, identify, and analyze advertising techniques used to encourage drug use. - report conclusions derived from viewing the film "Breath of Life" from American Cancer Society. - write the causal relationships between short-term and long-term smoking. - list the relevant laws concerning drug use and driving while intoxicated. - diagram the short-term effects of drinking versus the number of alcoholic drinks. - decide as a group the solution to a given problem related to social drinking. - draw a chart delineating drug use behavior as opposed to drug abuse behavior.
- the current treatment of drug problems and possible solutions.		- describe the available treatment programs for the heavy smoker. - compare and analyze the multi-dimensional programs of Alcoholics Anonymous and Synanon for the rehabilitation of the alcoholic. - describe the available treatment programs for drug abusers on the local, state, and national level. - list alternatives to the solution offered by drug abuse programs.
- and understand critical first aid procedures in order to prevent injury and death.		- apply, on a fellow student, the life saving steps of clearing the airway and applying mouth to mouth resuscitation. - demonstrate methods of controlling severe bleeding. - list the common symptoms and signs of shock. - demonstrate the procedures for the control of shock. - discuss the letal implication of rendering first aid.

SCIENCE	LIVING THINGS AS PRODUCTS OF THEIR HEREDITY AND ENVIRONMENT
Health	Grades 11-12

- dating is a social custom which allows boys and girls to understand each other.	- discuss the dating process with respect to group dating, double dating, and pair dating.
	- formulate lists of likes and dislikes in opposite sex. Compile lists into one for boys and one for girls. Discuss the final list.
	- discuss the problems encountered in the dating process pertaining to:
	  - alcohol
	  - drugs
	  - sex
	  - cars.

- family members influence individual personality and social development.	- trace the geneology of particular physical traits. - discuss your family's values on a particular social problem. Compare the group value with your individual value.
- family living experience should enable all members to develop into mature responsible adults.	- list their individual weak and strong traits. Cite examples of people who have shown a sense of security by taking a stand on a controversial issue. - list instances where he stood alone against opposition or in an emergency. - list proper rules of etiquette for different types of social situations.
- the family has certain functions and purposes as a social institution in our present day society.	- discuss the role of the family in the transmission of cultural heritage. - discuss the changing points of view toward education, driving, and drinking. - discuss the impact of inter-marriages upon family culture.
- the family satisfied the personal needs, aspirations, and desires of the individuals who make up the family.	- discuss various reasons why individuals would want to raise a family. - discuss marriage as birth of a family.

SCIENCE	LIVING THINGS AS PRODUCTS OF THEIR HEREDITY AND ENVIRONMENT Health — Grades 11-12
- various factors contribute to the success or failure of marriages	- discuss importance of permarital examination and counseling. - list factors that may contribute to success or failure of marriages. - research studies and statistics on marriage failures.

- the sum total of traits and characteristics make each person a unique individual	- write a paper on "Who Am I" or "My Personality"
	- report the influence of heredity, environment, health, education, family, and friends on personality.
	- list the factors which contribute to the 5 dimensions of man:
	  - physical
	  - mental
	  - social
	  - intellectual
	  - spiritual.
	- list traits of a person you particularly admire and one you dislike.

- your personal values emerge as a result of your family's influence and other varied experiences.
- mental mechanisms are used unconsciously to help solve problems.
	- discuss how value systems affect behavior patterns.
	- conduct a socio-drama of a family problem to arrive at a decision.
	- discuss and give examples of the following adjustment mechanisms:
	  - rationalization — projection
	  - sublimation — identification
	  - repression — rejection
	  - daydreaming — withdrawal
	- discuss the wide diversity of characters and personalities influenced by ego defenses and mental mechanisms for the following:
	  - introvert — specialist
	  - extrovert — "know-it-all"
	  - perfectionist — isolationist.

SCIENCE	LIVING THINGS AS PRODUCTS OF THEIR HEREDITY AND ENVIRONMENT
Health	Grades 11-12
- that maturity is the ability to deal with situations in your life in a realistic and effective way appropriate to your age level.	- discuss "What is Reality" - define "normal" from "abnormal"
- mental illness is classified by the severity of its symptoms and by the degree to which they incapacitate the patient for normal living.	- discuss the major categories of mental illness: psychoses and neuroses. - identify and describe: - schizophrenia - manic-depressive - paranoia - senile dementia. - visit the local mental institution and report to class describing aspects of visit.

SCIENCE

LIVING THINGS AS PRODUCTS OF THEIR HEREDITY AND ENVIRONMENT

A.P. Biology

Grade 12

The student will know:	The student will:
- the ultrastructure and functions of a cell.	- describe the historical development of the cell concept and cell theory including the contributions made by Hooke, Dutrochet, Brown, Dujardin, Schleiden, Schwann, and Virchow. - explain the role and limitations of biochemistry, centrifugation, and microscopy (light & electron) in understanding cells. - diagram, label, & describe the functions of the ultrastructures of a typical cell. - compare prokaryotic and eukaryotic, plant and animal cells.
- the process by which the cell reproduces	- compare and contrast mitosis and meiosis in plants and animals. - describe cytokinesis in plants and animals including control of cell division. - explain the role and limitations of chromosomes during cell reproduction and how genetic continuity is maintained.
- the processes involved in the study of genetics and the methods used to determine the genotypes and phenotypes of parents or offspring when knowledge of one or the other is available.	- define genetics as the study of heredity. - describe the history of early experimentation in heredity. - state the laws of dominance, segregation, and independent assortment and give examples through use of the "Punnett Square". - describe the use of a test cross (backcross). - compare and contrast the Punnett square method and the product rule method of solving genetics problems. - explain what is meant by incomplete dominance and predict the outcome of a cross between individuals using this concept.

SCIENCE

LIVING THINGS AS PRODUCTS OF THEIR HEREDITY AND ENVIRONMENT

A.P. Biology — Grade 12

- the meaning of gene expression, combination and location on the chromosomes and how these factors affect offspring.	- describe the reasoning used in developing the hypothesis that one allele for a particular trait is carried on one homolog and that the other allele is carried on the other homolog. - differentiate between the X and Y chromosomes and their role in sex determination. - explain what is meant by the term "sex linked characteristic" and "sex-limited" characteristics and state an example of each. - apply the rules of probability to solve a problem involving multiple factor (polygenic) inheritance. - apply the rules of probability to solve problems involving multiple alleles. - describe the chemical, cytological, mutational, functional, nature of the gene. - list mutagenic agents.
- the chemical basis for the transmission of traits and of the characteristics of genes and their chemical structure.	- describe an experiment in which DNA caused transformation to occur in Pneumococcus bacteria. - describe an experiment which identified DNA as the hereditary agent in Bacteriophages. - compare and contrast the structure of a nucleotide and ATP. - indicate the manner in which the four DNA nucleotides join each other in the DNA molecule and sketch a segment of a DNA molecule. - describe the structure and replication of DNA and relate this to the processes of mitosis and meiosis. - indicate that visible traits result from an interaction of genes and that each gene is responsible for the synthesis of an enzyme.

SCIENCE

LIVING THINGS AS PRODUCTS OF THEIR HEREDITY AND ENVIRONMENT

A.P. Biology — Grade 12

- describe the roles in protein synthesis of m-RNA, ribosomes, t-RNA, ATP, enzymes.
- state evidence for the genetic code.
- define transcription, codons, anti-codons, translation.
- describe regulation of gene action.
- describe the function of : structural genes,
- operator, operon, regulatory genes, and repressors.
- explain cytoplasmic inheritance.
- compare and contrast gene mutations and chromosomal mutations.
- describe an example in which a mutation affecting the sex cells might spread throughout an entire population.
- state the reason for the occurrance of: Klinefelter's syndrome, Down's syndrome, and Turnerk syndrome.

- how the principles of population genetics can be used to explain the evolution of adaptations and of new groups of organisms and the factors which affect the growth of population.

- describe the experiments conducted by Stanley Miller to test the hypothesis concerning the origin of life suggested by A.I. Oparin.
- compare and contrast the experimental evidence of Miller, Vrey, Calvi, and Fox.
- explain behavior and its basis in heredity and biochemistry.
- explain the relationship between adaptation and ability for survival and reproduction.
- explain how evolution is dependent on opportunity.
- cite an example of a series of adaptations which would support the idea that evolution is a series of minor changes.
- describe alterations of Hardy-Weinburg equilibrium by migration, mutation, natural selection, and genetic drift.

SCIENCE

LIVING THINGS AS PRODUCTS OF THEIR HEREDITY AND ENVIRONMENT

A.P. Biology

Grade 12

- describe the effect of isolating mechanisms on speciation.
- explain how a species might become extinct.
- list two accepted definitions for the term species.
- list the conditions which are necessary for adaptive radiation to occur.
- describe abiotic and biotic factors in regulation of population growth, including the manipulative role of man.
- describe the present status of human populations including density, growth rates, biotic potential, and carrying capacity.
- explain the effects of overpopulation.

- how evolution occurs, the causes of changes in population gene pools, and how a biologist studies relationships among organisms and their ancestors as evidence supporting the theory of evolution.

- indicate that central to the main theme of evolution is the concept of mutation as the ultimate source of genetic change and the diversity of adaptations result from these changes.
- cite theories of the origin of life with evidence.
- define the mechanisms of life with evidence.
- define the mechanisms of evolution: catastrophism, inheritance of acquired characteristics and natural selection.
- describe the major trends in plant and animal evolution with emphasis on common and different solutions (structural, physiological, biochemical, behavioral) to basic problems of living in different environments.
- explain "Ontogeny Recapitulates Phylogeny"
- describe man's role in the evolutionary process.

SCIENCE

- the basis of behavior in heredity and biochemistry.

LIVING THINGS AS PRODUCTS OF THEIR HEREDITY AND ENVIRONMENT

A.P. Biology — Grade 12

- compare and contrast kineses, taxes, reflexes, and instincts.
- describe habituation, imprinting, conditioning, and insight learning.
- list and describe three genetic and biochemical abnormalities.
- describe examples of behavior controlled by a biological clock.
- define a society as a group of animals living together in an organized way.
- describe the manner of communication among bees as observed by Karl van Frish.
- compare and contrast territoriality and social hierarchy.